Notebook Series -- Notebooks by Edison
Notebook, N-19-11-04

This notebook was used by Edison during November-December 1919 for entries, some continued from N-19-10-06, pertaining to a variety of subjects. The notes at the beginning of the book relate to the formation of zinc and copper oxide plates for batteries, the motion of sound waves through long tubes for recording purposes, and the reduction of iron by hydrogen for use in storage battery pockets. There are also notes and drawings concerning diamonds used for phonograph recording and reproducing, including one entry bearing the notation "up to date science applied to the Diamond grinding industry." Some of the notes pertain to the electroplating and electrolytic cleaning processes involved in disc record manufacture. One entry lists the steps in the production of disc records, while another describes current practice for stripping the record molds. There are also recording experiments involving various placements of the funnel and variations in its length, along with experiments to find a substitute for the celluloid used in Edison Blue Amberol records. The entries toward the middle of the book relate to the regeneration of old storage batteries. Also included is a list of what to patent from research on a Ford automobile starter battery. In response to learning that an employee has been misreading the ratings of batteries being tested, Edison comments "verily the Entrepreneur is up against the low mentality of the modern American young man." He also notes that "I am working all night to right other people's neglect." The cover is labeled "No 6 General Book Novembr 1919." The pages are unnumbered. Approximately 60 pages have been used.

Nov 4th 1919

I took some fine Zinc dust + pressed it into button 25/32 thick used 3000 lbs on it.

It seems to be just like solid Zinc Metal very strong + good surface

I shall try these in CuO 20% NaOH. to act as negatives

I figure that if a Zinc plate for a battery with alkali is made this way that the $Zn(OH)_2$ need not dissolve in the soda at all as it will probably fall off as a powder + go to bottom of cell + that the large volume of alkali necessary to actually dissolve the $Zn(OH)_2$ will not be necessary This property of forming powder will be valuable

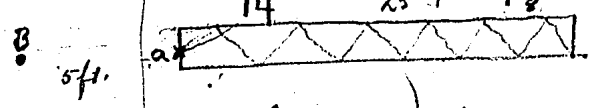
in a dry cell where colloid or blotting paper is used because the ZnOH will be a porous powder permitting free passage of the alkali to the Zinc & making it unnecessary to actually depolarize the Zinc it really act like, as in the alkaline storage battery —

Another use I intended for the pressed Zinc powder plates was to use them as a lap — Powdered diamond bort being mixed in the Zinc powder before moulding — Then the lap would be charged all thru & be held in place — The diamonds being recovered by dissolving plates in acid & filtering out the diamonds to be used again & so on

I am now processing a disc 5/8 same as I did Zinc using very finely divided Iron from Carbonate of Iron Reduced to metal by Hydrogen + when cool displacing the H by CO_2 to prevent it taking pyrophoric +
This would make a stronger Lap than Zinc

I have had laid out on the drawing board 7 cylindrical tubes each 20 ft long with following Diameters

2	25 ft
4	25 + $\frac{3}{32}$
6	25 + $\frac{1}{4}$"
8	25 + 3/8
10	25 + 9/16
12	25 + $\frac{27}{32}$
14	25 + $1\frac{1}{8}$"



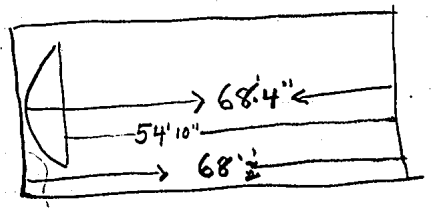
If a source of sound starts at X
The length of the straight waves from the Center is 20 ft.
but the length of the greatest reflection wave is 28 ft
for all Sizes of tubes

But if source of sound is 5 ft away from a + at B.
the lengths of waves will be see X

The length of the waves in the tubes alone at a is always 8 ft longer for the worst condition than the length from the center producing great muffling

But when 5 ft away. the length of the waves in the worst condition is only very little. One + 1/8 inch with 14 inch tubes — Hence great diminution in muffling

Columbia St Studios



30 ft wide

Oct 5 1919

Iron by H. Cleared with CO_2 from Carbonate procedure No 2 Daughtry - pressed in pockets, very light most Ural could get in about 6 grams To 1 Volt

Run	8077	8078	8079	8080	
6th	487	612	475	400	disch 750
9th Run - Chg 400 ma 15h disch 300 ma to Volt					
9th	745	775	745	700	

Nov 5 1919

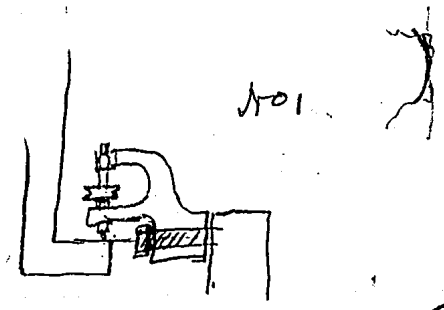
We grind the Sulphate Copper after Dehydration on Hot Steam plate, in the Little Porcelain ball mill — Use 9 lbs of 5/8 steel balls grind — One hour min — 90% goes thru 180 mesh screen is OK —

So far the best CuO Cell is mix of CuO thru 180 — 100 gram 8% of Dehydrated Cu Sop thru 180 mesh — Mixed in mortar by hand adding 6 cc of 20% NaOH gradually and co mix it Moulded at ___ lbs in hydraulic & baked 1000 to 1100 but not below 1000 — for 3 to 5 hours Dried on hot plate before putting in furnace — Best one Stands 20 ft drops & 20 3 ft drops — 82 amph output Constantly at .7 Volts 400 ma rate + is

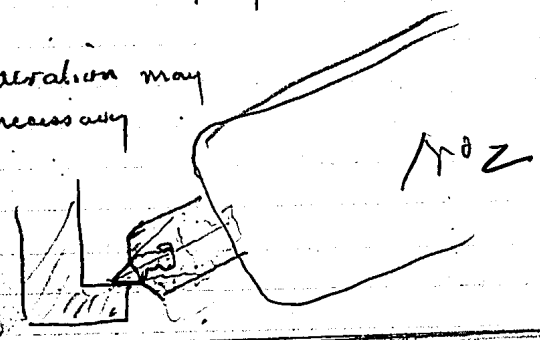
remarkable for high output
gives 730 amp h as compared
to a 2 plate reg cell as
far as CuO is concerned,
after fully reduced & washed
free of salts & dried it
stands several 1 ft drops
& is incomparably stronger
than reg CuO plate pieces
after reduction showing
integral character —

We do not get the CuO down
constant in drop test
perhaps due to imperfect
mixing or imperfect loading
the latter is probable cause

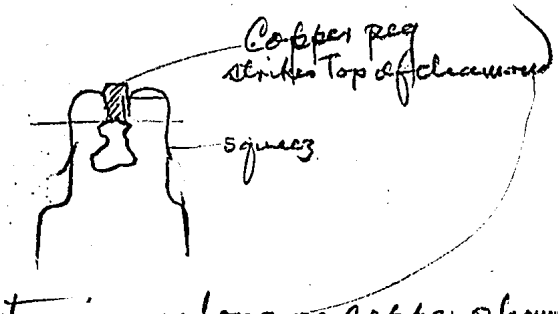
Diamond Point-
Recording Saphire is
.008 Dia
Reproducing Diamond
.007 Diameter



No 2 operation may
not be necessary
at all,

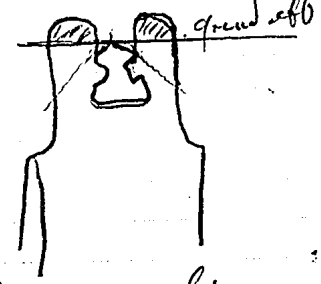


Diamond Could –



Entwining as long as copper shows you know you haven't reached diamond

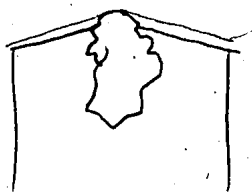
Also grind steel off flat until Diamond shows by using Carborundum lap - fine dust.



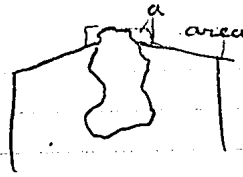
probably can roughly angle it with Carborundum lap for steel only – Thus no lathes turning tools + labor + loss by breaking lap till diamond shows top of sides

lap worn off with Carborum lap -

Then use No 1 to round



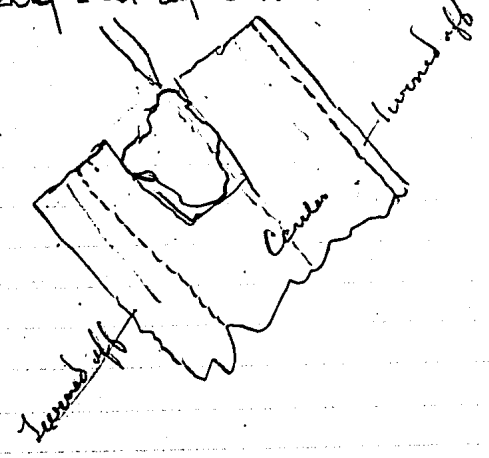
this line by Carborundum lap



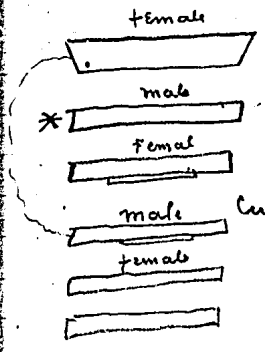
area for Carbo lap

a - lapped by Diamond lap No 1 machine

It will be impossible to set the diamond in the hole in the chuck so the best available point of the diamond will be in the exact center of the chuck But after diamond is exposed The chuck or holder can be centered under micro by a sharp point and chucked at this point the steel being turned so body of holder is concentric with center of diamond, if this is found necessary where stones are very out of center



Tel Nov 6th 1919



Wax

Master metal mould Cu

Label on this

2nd Master

Female

male Working M Nickel

The above is with 8/4 no celluloid

Working OK as per Gall.

6 sets 72 records in press Nov 6 1919

Gall says good.

* Master Metal mould only used once then goes back to Vault

2nd Master is the one repairs are made on -

Will also send some females (when got enuff records) back to Vault so if get further orders can use them also -

Nov 7 1919

I found the old die we once pressed iron mix in uniform of plates to go in pockets of Mfg St Bat -
Made some slips of flour of Zinc 15 grams -

about $\frac{1}{8}$ thick.

I will set up 3 small cells using one Zinc plate + 1 disc of CuO with not enough 20% NaOH to dissolve the whole of the Zinc - I am in hopes that when the NaOH is saturated with ZnO that the ZnO in situ will be porous so as to permit action to go right on notwithstanding it will not dissolve, this due to non integral character of the pressed Zinc, if it does

it makes a dry CuO Zn Cell with porous absorbers a success - (12) a perfect dry cell

There is 3 Cells with Zinc stripes made with 1000 lbs pressure 2000 lbs + 3000 lbs —

Also made 3 iron by H powder (Doughlery No 2) They look fine will last one in Gallery —

The other one will weld in Hydrogen + Keep one 1000 lbs for Cell 3000 to Keep + 2000 for welding —

This consolidating fine metallic powder into difficult shapes by moulding + afterward making the cohake integral by high temperature in an inert gas say Hydrogen has a great Commercial use

Zinc Callipered	1000 lbs	128–1000
	2000	113
	3000	107
Iron "	1000	125
	2000	105
	3000	94

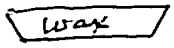
Have sent 3 iron bent H slips as above over to D Bat Co to have run thru hydrogen & weld integral

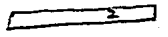
~~but~~

Heat was not high enough to weld integral, shrunk much

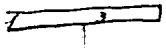
Nov 7 1919 —

Following is method now being used in the stripping process, 8/4 films no celluloid





Copper master mould



Female stripping of Copper, This stripping is played by a special light weight reproducer which does not in any way injure the female but makes it possible to detect every defect and makes the repairing of the female a simple matter

After female is repaired the label a is stuck on by shellac & then prepared in usual way for plating

Second Master, which is better than the original because it has not lost a particle of the detail, no increase in surface noise, defects which original had being eliminated

over

bears the label practically
does away with repairs in
next operation because they
have all been taken care of in
making 2nd Master - Insures
the original master which may
be returned to the Vault,

00000
00000 } Ten females made from 2nd
master which practically
need no repairs

00000
00000 } Ten Nickel working moulds
from each female.

Phonograph Recording

1st foot of big end of long funnel 14" dia at big end has 16 times less friction that the foot at the small end.

If we double the length of the 14" funnel we will when the voice is 6 ft away from the mouth get $\frac{1}{63}$rd of the sound wave, with present length we only get $\frac{1}{333}$rd.

By doubling the length of 14" mouth funnel we only increase the friction 20%

At 6 ft with double length funnel the voice will be 1/5th more muffled, at 7 feet the muffling will be the same as with present funnel as the angle at 7 ft is so much better.

The volume of sound

will be nearly twice as
loud or correctly 80% of
double loudness,

g

I fear all our work for last 2 months in getting higher Voltage on CuO battery has been useless. The Experimenter has been reading .040 MV instead of .400. although he has looked at it for 2 months & it is plainly marked
Verily the Entrepreneur is up against the low mentality of the modern American young man =

I find there is no trouble in getting a fine surface on Matte side of the plated Nickel sheets .001 thick used fine Emery paper.

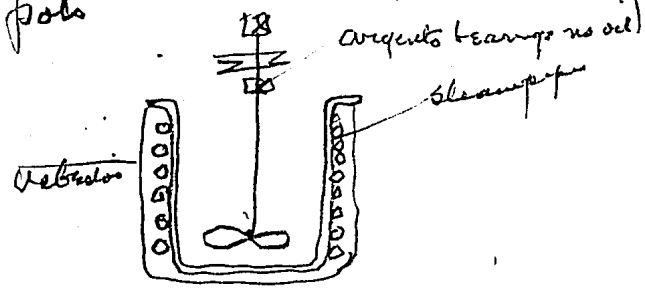
Believe we can quickly polish right on Cathode before removing

I made up fairly strong 8/4
Selenic acid sol 1/2 min to
dark red — put 4 unvarnish
Disc slips in at 11 10 am
Now 10⁻¹ after a number of hours
will take out 1 + bend it +
Examine it under Micro.
The others I will mix sulphur
with Reg Varnish + Condyne
it + see if Sulphur hurts
Matrix. Idea being to
Mould records with
Hard rubber mixture + prevent
S from hurting Mould
also as a substitute for
tin foil in hard rubber
sheet making ~

Took some of Big Lot.
Pi dise ~~electrolyte~~ that
went bad

Nov 7 1919

Gall has rigged up 2 stirring pots



for Taking out 25 gals at a time from General Ni plating Sol & neutralizing the acetic by dissolving Nickel hydroxide

The other pot also used for this — both or one pot can be used for making new solution $CuSO_4$ acetate Ni. —

100 to 110° Fahr is best for neutralizing if done at 140 the acetate Ni hydrolizes

GJ

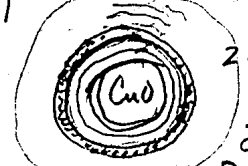
Gall will furnish me with a drawing of a glass holder in place of a Condensito holder for rotating shaft in plating bath. These do not remain flat when heated to melt the sticking on wax whereas the glass will not warp. We get the special glass from mfrs of our battery jars which sustain such extreme variations in temperature without cracking —

We stick the metal mould face down on the glass using a mixture of stearic acid & Rosin. This works perfect & prevents plating solution running. It works so far 100%

When we get blanks we will surface face flat & sides to fit the holder in bath —

Nov 10 1919

Dry cell — wax paper —



2. Perforated Zinc Shell filled needs well Zinc powder & placed in Hydraulic 3000 or less —
all soaked 28% NaOH.

NOTE

I find that 8/4 Selenide Cu must not get too thick if a solution turns red in 1/2 minute & then Copper left in 7 minutes it flakes & rubs off

So in redipping a Cu disc mould & it takes 1/2 min to get dark red the Redip in the same strength of 8/4 should not be over 6 seconds,

CUS

Nov 11 1919

Regeneration of old Storage battery mix

After 80 hours in the reducer 100 grms of mixture yield

19.8	Requiring more reduction
49.2	Nickel hydroxide
2.6	Nickel flake fine
2.6	" Coarse
2.0	$Ni(OH)_2$ as $NiSO_4$
13.2	Moisture + Alkali
10.6	Mechanical loss
100%	

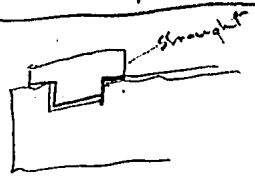
A Delaunde good drop. CuO
put up with 2 Zincs 1/2 sq
or 2" surface 2 1/2 inch in
solution 20% NaOH. Amalgamated
on surface ~~[illegible]~~
Went 76.8 amp Hours
~~to~~ to .5 Volt. Whereas
2 Reg sized Zn went to 82 amp
to .7 Volt, showing must
have more Zinc surface
than 5 inches to keep
Voltage up — 78° Fahr
Room temp average on Round
CuO —
Both Zinc are increased
One has 1/32 inch hard crust
hardly cut off with knife
after chipping found both
well amalgamated — it is
the increased Solution that ran the
Voltage down in addition to
high density of Current —

Calculate it out

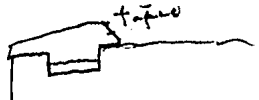
I Cleaned Zinc & put Complete in
new Sol and 1/2 hour .67 400 ma
went below .50 V in 2 Hours + 1/4 CuO good gas

Delaunde

At Silver Lake pressing CuO plates. One man weighs out & puts in Mould the other man at press. presses 125 per hour.



present ring



old ring

We have 2000 old rings will try use them — but will try out 2 press loads for 2 months or get % before using other alloy

Upto date science applied to the Diamond grinding industry

A soft lead bullett passes thru ½" of hardened tool steel at Velocity of 2800 ft second A Candle can be shot thru a 1" pine board with proper Velocity - A thin plate of steel with 15 to 25000 ft per surface Velocity at the Edge Cuts off steel bars rapidly when Cold with only little wear to the Edge of the disc

So I am building Lapo with a Velocity of 17200 ft a second to grind phano diamonds & thus saves Diamond powder this increased Velocity is many fold greater than Lapidary art Ever conceived up — There is some rate or Velocity that Saphire & Even Carborundum will grind the Diamond

Nov 14/19 Ford Slocum

Patented 1- forming Ni sheets
2 = assembled battery end plates
bolted together -
3 - did? file spacer for spreading
active material by flotation
4 = patent side connections,
5 " two staggered lugs each sheet
6 " float index for water
7 " previous alkali treatment
of the paper,
8 gas channels -

Nov 14/19

Our plating equipment to date is
1560 Baths - divided as follows

200 Sulphate Nickel
1200 General Copper
160 Preliminary Cut Master
1560 -

Gall says above equipment is far beyond our present requirements when we get making all our moulds by stripping process. This great capacity permits us for first time to mfr new moulds of entire Catalogue of standard & Classic selections, which we so urgently need.

Daily Capacity 400 stripping of Nickel & 400 Copper backs daily

Experiment for neutralizing Reg
Ni SO4 Conc + Acetate Ni Bath
used on works for plating
stripping discs –

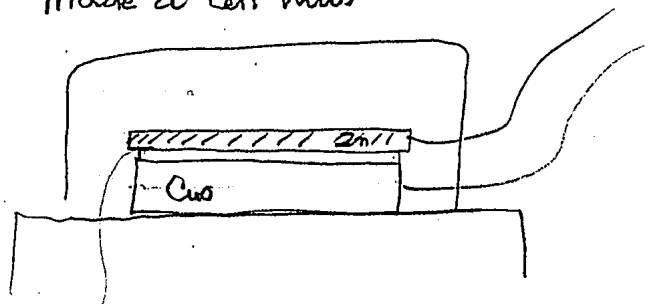
Took 1500 cc of solution from
big crocks in factory that
been plating 78 Baths for
10 or more days

Found that at 100 @ 110° Fahr
it becomes neutral with
of hours with stirrer

Used 14.3 grams wet Ni hydrate
from Miller which contains
30% water – or 10.1 grms dry
Then it was filtered through
2 thickness of Linen (fine).
it went down in 20 minutes
diameter bag 2" length
where liquid was 5".
Sediment after drying
weighed 5 grams –
Sol neutral using 5 grms 1½ liter

Nov 18 1919

Made a cell thus



Reg Blotting paper wet with 20% NaOH.

Dia of CuO plate 2" 9/32 Reg Cast Zinc No Hg

	Volt	Milamp
1140 am-	.82	100
1240 pm-	.77	"
140 "	.68	"
240 "	.60	"
340 "	.59	"
440 "	59	"
540 "	58.5	
on all night		
8.30 am	.51	"
930	.01	15 gone

Ran 21 Hours. 2.1 amphours

5" inches CuO + Zn surface Each 5

420 Milamp per inch of CuO

C813

Nov 18/19

"2" bag 2 thickness of finest weave linin, filters thru 5" of its length, 1½ Liters of New Nickel plating Solution when neutralized by $Ni(OH)_2$ J V Willard Reg — leaving Residue in bags — The particular Experiment tried 10 grms were added to 1½ liters & 5 was taken up making Solution neutral, 5 left on bag

Hence 1 ft of 2" bag filters 2 gals per hour.

Nov 20/19

Experiments for substitute for Celluloid for Blue Amberol Records as Can get no more Celluloid after July 1920 on account of the Camphor shortage —

Took Pontiac Rubber & Mixed in hot rolls with China Clay — after reaching limit of Clay it is too dead & scratches easily & acts like thin lead —

20 grms Pontiac 4 grams Sulphur 5 grams China Clay good even sheet like soft lead — Vulcanized between 2 8/4 in slips in sand bath over flame Went to hard Rubber good black polish hard, Came away from the sheet fine, had cavities as done in 5 min & too sudden This can be made to work

Ambrosol Condensation

Think I can take smooth inside Cylinder & Coat Reg Condensite Varnish 2 coats, then put in Kiln & bake to 1st Condensation point Cool & remove — Use this to print with say 4% Paria, Chill & remove back up with Cluster Fabric

Some Crepe Rubber. (Mat for tea tray)
20 grms - 4% sulphur
+ lots of China Clay —
Dont stick to Roll & stand lots clay - finally check on Roll by Hack Cohesion, but let run it out 1/32 or less get sheet OK 2 ft long - 3" wide.
its lumpy — Roll must be very hot at end

When cold strong only has a little of the Rubber nature - If Sulphur is

might think it will Vulcanize
to Hard Rubber →

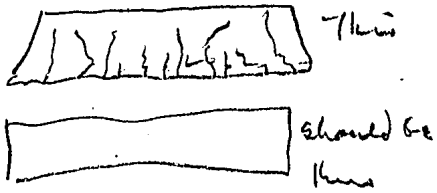
Note = It is a phemenona that
all Ni plating Solutions improves
as they get older in our
strip Tumbler Cells it takes
about 6 Runs to bring them
all right This phenomena
Runs through all kinds
of Ni Electroplates & I believe
that it is due to a very
small quantity of some
metal which accompanies
all nickel -
I shall run it down &
find what it is -

Nov 25 1919

Lelande –

I find the strength of the CuO plates depend largely on the way they were dried in the air –

If the $2\frac{1}{4}$" disc is moulded & laid on a screen & dried in Room air They generally have Cracks in them. The Top & Sides get dried 1st This causes shrinkage & as core is not dried they crack – The bottom is bad When put in furnace this defect is Multiplied.

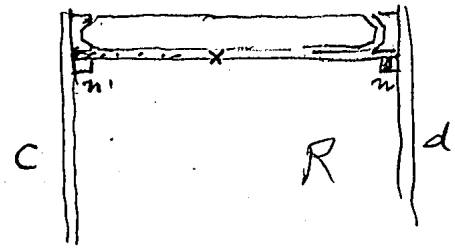


Hence should be dried hot & on all sides at once –

C913

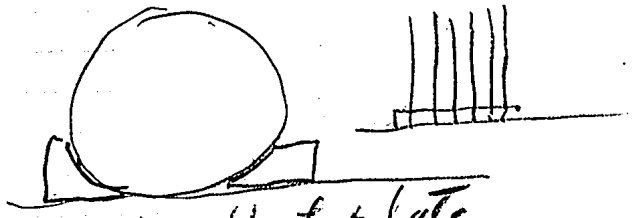
Took 10 grams CuO 150 mesh, dried it then added 10 cc water mixed in Mortar, then laid it out on glass dried 2 hours it appeared dry
Sample by Edison gained on rubber head 40 mlg
by Hart 48 " "
The porosity of individual particles is therefore small & of no account.

I propose drying reg. plate 4×5 –

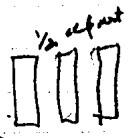


after processing put on non-plate shoot in rack R. When full turn up & make C the bottom & the top & withdraw plates X from thin pins n' n. Then can goes all over

Gall Nov 26 1919 says he
takes the 2 wax masters of
Each tune, plates + gets copper
masters, One of these he puts
permanently in vault, the
other he films with 8/4
+ gets all his factory
moulds from one print
from this, + puts it in
Vault, So we have
one Master never used
+ One Master filmed
once with 8/4 print
in Vault, so if anything
should happen to filmed
Master we still have
a Virgin never filmed



Hot plate



This is best as hot
air covers whole surface

Equally - should have
air above 200° fahr will
determine how hot
& how long —

We determine perfection of
baking of the 2# dough
by dropping it 6" high
on blotting pad & then
throw which make 20
falls without breaking
we let fall 12" good
ones so far all dead
20 6" drops & from
1 to 7 at 12".

Should all go 20 at 6"
& 3 or more at 12" after
the 20 6" drop —

All the above are
Not baked to 1200 —

These should go 20 1ft
& at least 6 drops at
3 feet —

Dec 1st 1919

Gall reported his bag No 504
Nacetate sol gone bad,
OK up to Saturday 4 pm
They added some more solution
at that time & whole about
400 gals went bad.

They pulled it out of baths
piping & Crocks & made a
new solution just enough
to keep them going

I feel he has not neutralized
bath with Na (OH)2 since I
started although I told
him it must be done & he
was told to get Crocks,
Stirrers & filter bags ready
Keeping solution from 90
to 100 Tabs, now I feel
he has not used it,
Same old story —

All the bag sol is now

transferred to a seperate Crock
Soon as he told me went to
work to find out trouble
with Sol. 1st found it as
Expected very acid
2nd found it loaded with
Copper which is the worst
thing possible has about
1%

I find that Barium
sulfide in right proportion
added dilute and gradually
stirring for few minutes
not raised temperature
takes all the Copper out
The solution untreated
Coppers steel brads cleaned
by dilute HCl slightly -
But not when proper amount
of BaS is added - if too
much BaS is used it throws
down Nickel by abandoning
Sol of BaS all the Cu and
by eliminated with only
a little Ni -

I propose fixing the big Sol this way & then nearly neutralizing —

We should only use $NiSO_4$ & Ni Acetate free of Copper & Anodes as free of Copper as possible — also see backs of Cu Molders are well varnished so no exposed Cu to oxidize in air at each Revolution & hence this oxide dissolves in solution

Also Anodes scraped free of Cu at times & keep all Cu things away from the Solution —

The Sulfide of Cu settles quickly used 290 cc & while stirring poured it in a 290 cc Measuring glass put in 3.02 AM at 3.05 black precip sunk to 90 cc 3.10 am to 70 — 3.17 to 60 3.50 am to 48 cc
This morning 2nd 45 cc

It will be seen I am working all night to right other peoples neglect,

I have just taken out a strip from the little test cell — 1 hour 30 min 300 Ma rate OK plating + yet its the big lot that went bad + I have only removed the Copper by Ba S + have not allowed to neutralizing it its very acid — Strip Nearly as tough Ni as usual + only one Corner turned up showing that if it had been neutralized only a little the plating would be perfect. Beware of Copper.

5 cc of a saturated Sol of Cu SO4 put into 250 cc of pure Ni SO4 + 5 grms Acetate Ni makes it impossible to plate

Everything should be done to keep Copper out as its fatal to this Solution even in Traces

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I took some of big Lot and reduced + now in crucible added Barnsfield till free of Copper

A. Cell – nothing in –

B Cell – Nearly neutralized by NaOH

C Cell – 1 cc Ferric acetate Conc

D " 1 cc Conc Ferrous Sulfate

1 Hour 300 ma

~~1st test~~ A. worst of the 4 – Cracked, brittle, Comes off

B Ckd, + lifted, Ni fairly tough

C About same as B

D left Early brittle,

1 Hour 3rd Run		3rd Run
A	fair	Nineth Run
B	fair	All OK
C	not good	
D	very bad	

I find that a bad impression as more runs are made — until 7 Runs When all are alike — 1 hour 300 Ma one Edge on all slightly turned up

from this there must be some impurity in $NiSO_4$ solutions that produces the bad results and that it plates out in the Ni in time & when Exhausted the plating is fine —

9 | 5
1 | 1 What is it, find out

The regenerated $Ni(OH)_2$ from old returned Cells is full of ferric hydroxide & that seems the reason why they diminish in Capacity by heat. The heat cause greatly increased solubility of iron in the Electrolyte –

Mix from old cells when not too old has their ferric hydrox renewed fairly easy by reg treatment with glucose & NaOH, to green stage & on heat shows capacity fully equal to new $Ni(OH)_2$

But from very old cells for instance A6 giving only 130 amp hours instead of 225 the treatment produces a dark colored $Ni(OH)_2$ some of the particles green –

By a separate treatment with stronger NaOH, 10% & 1/2 % of glucose & prolonged heat. The whole of the iron

is removed, probably because weak glucose is strong Enough to reduce the ferric to Ferrous & the stronger NaOH, dissolves it. The result is bright green Na_2FeO_2

Velande — S Lake says they. Mould 100 plates per hour in one press. (500 amp type)

Dec 4/19. Doughtery is making some Tellurous Acid to see if forms a better film on Copper than Selenious acid (12) in respect to Expansion when on thick —

Dec 6 - 19

Regeneration —
Sample No 2 sent to Test dept Storage Bat for test. This is from 10 A6 Cells which only gave capacity of 135 amp-

Process 400 cc 10% NaOH 1% phenol
100 grms black $Ni(OH)_2$ or
30 " glucose -
Boil solution, add glucose in portions of 1/2 gram Every 8 minutes.
takes 1 1/2 hours $NiOH_2$ dull green has some fine spangles of flake

May not be enough in sample to make a test
Marked Edison No 2 $Ni(OH)_2$

New Experiments with $NiSO_4$ + acetate Ni

Pure $NiSO_4$ Cu out by H_2S -

250 cc - 1 grm acetic acid 300 ma shown thin but OK only 1 corner turned up tough -

ditto — 2 grms Ni Acetate -
Bad Cracked Sides turned up & Cracked = May be Acetate
Ni has Copper in it -

481
Very bad 2 grms ferric Sulfate
2nd one corner up thin -
476
OK in every way Thick Ni acetate 2 gr
2nd OK
477
OK but 1 Edge turned up
2nd 1 Cor up OK 1 grm Acetic acid

478 5 grms acetic acid
OK but 2 Edges up
Thin 2nd Very thin - Tough

479 - Very bad awful plain
M504 - 2nd OK - cor up

489 Very bad, 2 gr ferric acetate
2nd OK -

~~489~~
One Corner up - thin -

~~489~~

See further on

Mr Soy Cu removed —

477. 1 gm acetic acid

1st Run — OK 1 Corner up
2 " "
3 " " Sharp point 2 Edges up not tough
4 " " no points not very tough 2 Cor lifted
5 " " OK. 1 Cor lift Tough & OK
6 " OK
7 Perfect Except few sharp points
8 perfect except few sharp points
9 Perfect
10 Perfect 1 Cor slightly up
11 Perfect, 1 Cor up slightly 1/2 dozen points
12 " 2 Cors up slight

478 — 5 gms acetic acid

1st Run OK 2 Edges up
2nd " OK but very thin Tough
3rd OK thin & not very tough thicker 2 Edges up
4th — Cracked side Corners lifted not tough
5th Cracked 1 on side — Corners all lifted Not Tough
6 1 Corner bad turn up, not very tough
7 faint 1 Cor up — Tough —
8 OK 2 Cors up —
9 1 Edge up —
10 Good 2 Cors bad & top slightly up
11 perfect 1 Cor slightly
12 " plating 4 Cors slightly

479 Reg Nesoy rolling in

1st Run Very bad - awful
2nd Run OK 1 corner up
3rd Run OK. 1 " not perfect at edges Tough
4 " OK edges little ruff fairly tough, flat
5 OK no lifts tough ? ? ?
6 2 cor very slight turn up Tough
7 Perfect except very faint 1 cor up
8 full of points bad, otherwise OK ?
9 full of points bad "
10 Perfect
11 Perfect
12 " 3 cor slight lift

480 2 grms Fabric acetate

1st Run Very bad
2nd Run OK
3 Run OK thick. tough
4 Run OK faint turn up 1 corner — Tough
5 OK no lifts Tough — Very good
6 1 slight lift Very Tough, thick
7 perfect 1 cor slight up —
8 Perfect
9 full of points Very bad "
10 full of paint not bad
11 Perfect 1/2 doz points Curls colum off
12 Top peeled up — perfect plateau

481 – 2 grams Ferric Sulphate

1st Very good.
2 Good fair 1 Cor up –
3rd fair poor edges – no Turn up
4th few points .. turned up slight 4 points fairly Tough
5 OK no left Tough –
6 2 Cor turned up slight, tough
7 perfect.
8 perfect.
9 perfect.
10 1 corner up slightly considerable points
11 perfect
12 perfect 1 corner up – flat

476 – – 2 gram Ni acetate

3rd 1 Edge up not Tough
4th 2 Cor lifted not very Tough
5 good faint left 1 cor tough + OK
6 slight turn up 1 cor OK tough
7 perfect –
8 perfect.
9 perfect
10 " a few points
11 " " "
12 " perfect 1 Cor up

506 = 4 grms Ferric ~~Lactate~~

1 = Like polished school, thin, brittle, Cant strip

2 Come off entirely. left full 2nd coat,

3 Come off nearly all – Mirror like, brittle

507 4 grms Ferric acetate

1 = OK – Tough,

2 Half Curled up from bottom, 2nd Coat tough

3 bottom Loose, not curled up – not perfectly tough

482 250cc 3 M Acet 1 CoSo4
1st Jap bottom peeled up some, longrock

487 250cc 3 M Acet 1 Alum SO4
1= Dark, breaks straight up knife takes off as a powder Horrible pleading
NOTE Bad effects,

Dec 8 1919

Gave Moore some Fe_2O_3 from Fe Carbonate oxidized made by Dougherty to try in NaOH glucose to see if long boiling will reduce it to FeO ready for test in Cell — Watch it.

(13)